

# BULLETIN

OF THE

## BROOKLYN ENTOMOLOGICAL SOCIETY

---

VOL. L

FEBRUARY, 1955

No. 1

---

### STUDIES IN THE GENUS *EPICAUTA* OF THE NORTH AMERICAN CONTINENT (COLEOP., MELOIDAE) I—THE CAVICEPS-GROUP.

By FLOYD G. WERNER, Burlington, Vermont

The author intends to present in this series a treatment of the Mexican and Central American species of *Epicauta*, in relation to the fauna of the United States and Baja California, already covered. Supplementary notes may be added to the discussion of United States species when additional information is available.

North America, south to the Isthmus of Panama, is a much more convenient unit to handle than any artificially delimited region within the continent. Mrs. Vaurie has already shown the very close relationship between the Meloid fauna in North-Central Mexico and our Southwestern fauna. Champion's coverage of the Central American and Mexican species shows that there is a considerable overlap from Southern Mexico to Central America. And some species range from Southwestern U. S. to Southern Mexico. Panama has a rather poor representation in the genus, with closer affinities to northern South America than to the more northern fauna. All of the species known from Panama, except *E. flagellaria* (Er.) and *E. dohrni* (Haag), also range well into the area treated, however.

Some of the species groups found in North America are not known from outside the continent. Part have a species or two in extreme northern South America and these extraterritorial species will be included. The author prefers handling the genus group by group to attempting a separate Mexican and Central American coverage, which would involve guessing which of the U. S. species have ranges extending into Mexico and which have restricted ranges. Keys or tables for all the species in the separate groups will be

prepared, to supplement already existing keys and aid in the identification of the species. An attempt will be made to show relationships rather than simply to provide the easiest possible means of identifying all specimens.

Adequate series are not available for many of the species and it may be expected that additional variation will be discovered when more collections are made. In some cases it is impossible to assign a species to a group unless a male specimen is available. In these cases the species will be mentioned in the groups to which it might belong. The decision to break up the genus and handle it piecemeal is to some extent necessary because of the nature of the available material. In some groups all the species can be worked out with little trouble; in others nothing can be said at this time that has not already been said. If specimens of critical species become available during the course of the study, these groups will be included.

The species groups are sometimes difficult to define. They follow the groupings already established (Werner, 1945, *Bull. M. C. Z.* 95: 424-425.), with some alterations, which will be taken up in the individual cases. As exact a definition of each group as is possible at this time will be given. The *Diversicornis*-Group has already been treated. (Werner, 1949, *Psyche* 56: 74-80.)

The specimens for this study come from a variety of sources. Mr. J. Balfour-Browne has very kindly sent a good part of the *Biologia* specimens and offers to send anything except holotypes from the British Museum collections. Fragments of the Dugès collection remain in the collection of the Instituto de Biologia in Mexico City. These specimens have been studied, as well as a very small lot of *Meloidae*, probably determined by Dugès, in the museum of the university at Morelia, Michoacan. Some of the Dugès species are in the Sallé collection, now with the *Biologia Centrali-Americana* series. A very few specimens from Dugès in the U. S. National Museum complete the known remnants. The great bulk of the Dugès collection is said to have been destroyed by insect pests while it was in the Museo Nacional in Mexico City. The specimens in the Instituto de Biologia represent what could be salvaged. Many of the Dugès species are not represented in any of these places and in very few cases is it possible to ascertain whether a "holotype" exists.

Fresh material is available from the *M. C. Z.*, *A. M. N. H.*, *U. S. N. M.*, *Cal. Acad.*, *Chicago Nat. Hist Mus.*, and the *Carnegie Museum*. Drs. C. Bolivar and F. Bonet of the Instituto Politecnico in Mexico City, and Mr. F. H. Parker of Globe, Arizona have made the Mexican specimens in their collections available also. The

author has spent part of two seasons in Mexico and has series of some of the species with host plant and other information. In his collection are scattered specimens from other sources, including European dealers.

The total amount available is still far from adequate. The American Museum collection from Northern Mexico is by far the most impressive, but undoubtedly lacks many as yet undescribed species from that area. The total collections available from Southern Mexico are much smaller and the gaps must be correspondingly larger.

### The Caviceps-Group

The Caviceps-Group, equivalent to group "B" of Horn, has become more difficult of definition as it has grown larger. In the present paper fourteen species are included, one being described as new. When *caviceps*, *rileyi* and *straba* were the only known species, it was possible to say that the group consisted of all of the species of *Epicauta* with unusual modifications of the head. Horn used the form of the antennae as a distinguishing characteristic. The antennae taper gradually from the base and are not greatly different in the sexes. They are very uniform throughout the group but many species elsewhere in the genus have antennae similar or identical to those found in this group. Several of the species now included have the heads not at all modified; so it is necessary to seek new criteria for their inclusion.

The group contains all of the species of our fauna, and probably of the World fauna, in which the meso- and meta-femora and trochanters of the male are more or less denuded behind, the denuded area being fringed above with longer hairs. The tibiae do not have long hairs and the denuded areas on the femora and trochanters are not fringed both above and below with long hairs. The two species, *californica* Werner and *alphonsii* Horn, not included in the group, have similar leg characters in the male but the meso- and meta-femora are fringed both above and below and are conspicuously flattened in the denuded area. *Stuarti* Lec. is also excluded, even though the male leg characters are similar. In this species the partially denuded area has some long hairs included in it and the male meso-tibiae have fairly abundant long hairs, which are not found in any of the Caviceps-Group.

One characteristic that is diagnostic when it is present is the arrangement of some black spots on the abdomen. One set of small rounded spots is found on the anterior part of the lateral edges of the sternites. These are partially glabrous and contain some short, black pubescence. Another set, which is more variable, is a series

of posterior median sternal spots. These are small, and may be round or squarish, or elongated when found on the posterior sternites. They may be on any or all of the visible sternites except the last. The tergites have anterior median black marks; in this case they are usually elongate. They may be found on any of the sclerotized tergites. The only species outside the group that might be considered as having these abdominal markings, even in a modified condition, is *stuarti*. This enigmatic species has large antero-lateral spots on the sternites, a broad postero-median, black, partially denuded zone on the sternites, and tergites that are all black and might be considered as showing greatly expanded tergal spots. Some of the species included in the Caviceps-Group do not possess the abdominal spots at all and, of course, the species with solid black abdomens cannot be placed on this character.

The elytra have characteristic black markings in some species. A squarish spot near the scutellum is found in these; in some cases it extends along the far anterior edge and reappears as a narrow humeral spot. Here again some species do not have it and pure black species may have it and not show it.

A very peculiar characteristic that is expressed in varying degree in most of the species is an elevation of the suture of the elytra at about one-third from the base. In extreme cases this takes the form of a quite noticeable bump, which may become abraded. The suture may be somewhat elevated from this bump to one-fourth from the apex. In some cases this elevation terminates in a smaller bump. The only species assigned to the group that lacks the sutural character completely is *aspera*. In some of the others its expression is slight and it may be absent in part or most of the specimens. The character does not appear in any other part of the genus. Since its expression is variable, it is not a good key character. But it adds evidence that the Caviceps-Group is monophyletic.

The definition of the Caviceps-Group now becomes cumbersome. It includes (1) all the species with the characters of the suture of the elytra as outlined above; (2) it includes all the species with the abdominal markings, except *stuarti*, which might possibly be considered to have the markings in an extremely modified condition; and (3) it includes all of the species with the characteristics of the legs of the male as outlined above, excluding other species with further modifications in the same area. All the known species fit on two or more of these criteria and all other species are excluded by any one. Of the three criteria, perhaps the sutural character should be taken as the most definitive in assigning future species to the group.

In addition there are certain tendencies exhibited. All the known species are similar in size and shape, ranging from about 7 to 12 mm., with most specimens near 10 mm. and all being moderately narrow. None of the species departs radically from the others in either size or shape. There is a strong tendency toward head and eye modifications. In the most extreme cases the head may have

Table 1

Characteristics of the various species in the Caviceps-Group

|   | <i>aspera</i> | <i>wheeleri</i> | <i>rehni</i> | <i>occipitalis</i> | <i>singularis</i> | <i>diversipubescentis</i> | <i>cicatrix</i> | <i>excavatifrons</i> | <i>straba</i> | <i>afoveata</i> | <i>impressifrons</i> | <i>caviceps</i> | <i>rileyi</i> | <i>insueta</i> |
|---|---------------|-----------------|--------------|--------------------|-------------------|---------------------------|-----------------|----------------------|---------------|-----------------|----------------------|-----------------|---------------|----------------|
| Characteristic elytral suture elevation       |               | X               | X            | X                  | X                 | X                         | X               | X <sup>1</sup>       | X             | X <sup>2</sup>  | X                    | X               | X             | X              |
| Male legs fringed                             | X             | X               | X            | X                  | X                 | X                         | X               | X                    | X             | X               | X                    | X               | X             | X              |
| Characteristic spots on abdomen               | X             | X               |              | X                  | X                 | X                         | X               |                      | ?             |                 | X                    | X               | X             | ?              |
| Scutellar spots on elytra                     | X             | X               |              | X                  |                   | X                         | X               |                      | ?             | X               | X                    | X               | X             | ?              |
| Pronotal pubescence not all directed backward |               | X               | X            | X                  | X                 | X                         | X               | X                    | X             | X               | X                    | X               | X             | X              |
| Some short, velvety pubescence on pronotum    |               |                 |              | X                  |                   | X                         |                 |                      |               |                 |                      |                 | X             |                |
| Pronotum humped on disc                       |               |                 |              |                    | X                 |                           |                 | X                    |               |                 |                      |                 |               | X              |
| Conspicuous margin next to eyes               |               |                 |              |                    |                   |                           |                 | X                    | X             | X               | X                    | X               | X             |                |
| Eyes oblique and narrow                       |               |                 |              |                    |                   |                           |                 |                      | X             | X               | X                    | X               |               | X              |
| Pit at posterior inner margin of eye          |               |                 |              |                    |                   |                           |                 |                      |               |                 | X                    | X               | X             |                |

<sup>1</sup> In a modified condition.

<sup>2</sup> Very faint, absent in some specimens.

<sup>3</sup> Pubescence all black in area.

conspicuous knobs or excavations and the eyes may be extremely oblique and narrow. There is also a tendency toward smoothing of the eye facets, at its extreme in *rileyi* and *excavatifrons*, in which the eyes are almost completely smooth. The pronotum tends to have the anterior angles more distinct than in other species and also tends to have the pubescence directed out from the middle, in whorls, or even directed anteriorly over part of the area. In the most highly modified species there is some very short, erect, velvet-like pubescence on the pronotum. In several species the pronotum has a distinct hump; in others it has a longitudinal bulge with lateral depressions. These tendencies help to set the group off from all others in the genus, even on a World basis, but are not too useful in its definition because they are so variable in expression. Table 1 summarizes the presence or absence of these characters in the known species.

In the following key the known species are arranged so that the least modified appear first. The species following are arranged as nearly as possible in sequence from the less to the more complex. The species *aspera* is the least modified of any; it has a simple head and pronotum. All of the rest are modified in some degree. *Wheeleri*, *occipitalis*, *singularis* and *diversipubesceus* form a quite homogeneous group. *Afoveata*, *impressifrons*, *caviceps* and *rileyi* form another quite homogeneous assemblage, with progressively greater modification. Of the remaining species, *cicatrix* would fit near *singularis* were it not for the unique modification of the second antennal segment. *Straba* is most probably allied to the species around *caviceps*. *Excavatifrons* stands isolated, as does *insucta*. It is interesting to note that the two species most isolated structurally are the two most isolated geographically.

#### KEY TO SPECIES

- A. Mandibles of normal size, not enlarged and directed angularly backward.
- B. Eyes not margined by a conspicuous glabrous area.
- C. Second segment of antennae normal, without a scar-like area.
- D. Pronotum without denuded areas at the anterior angles.
- E. Occiput truncated or rounded, not bulging.
- F. Elytra with black scutellar spot; abdomen with the black spots typical of the group.
- G. Pubescence on pronotum of same color as on rest of body, cinereous to dull luteous, directed

- backward. Colo. to W. Texas and E. Ariz. (White Mts.) ..... *aspera* Werner
- GG. Pubescence on pronotum orange, on rest of body cinereous to dull luteous. Ariz. (Sabino Cn., Globe, Superior, Phoenix); Calif. (Morongo Valley near Palm Springs, Whitewater); Nev. (Glendale); Utah (St. George) ..... *whecleri* Horn
- FF. Elytra without black scutellar spot; abdomen without black spots. Pubescence dull luteous. Ariz. (Chiricahua Mts. to Baboquivari Mts. N. to Phoenix) ..... *rehni* Maydell
- EE. Occiput bulging conspicuously. Pubescence dull luteous.
- F. Pronotum of normal shape, bulging slightly. Vizcaino Desert in Baja California. .... *occipitalis* Werner
- FF. Pronotum with a conspicuous hump. Monterrey, N.L. and Saltillo, Coahuila .. *singularis* Champ.
- DD. Pronotum with the anterior angles, and often the posterior angles, denuded and opaque, with some very short, erect, black pubescence on the margins of the denuded areas. Pubescence cinereous to dull luteous. Rio Grande region of New Mexico and El Paso, Tex. .... *diversipubescens* Mayd.
- CC. Second segment of the antennae with a conspicuous, glabrous, scar-like area. Presidio, Tex. .... *cicatrix* Werner
- BB. Eyes with a conspicuous denuded margin, at least behind.
- C. Head without a pit-like depression at the inner posterior margin of each eye.
- D. Pronotum conspicuously humped. Elytra without scutellar spots; abdomen without black spots. Pubescence cinereous. N. Fla. and coastal Ala. and Miss. .... *excavatifrons* Mayd.
- DD. Pronotum not humped.
- E. Pubescence black; elytra sometimes with narrow white margins. Legs and underside often with some white pubescence. Eyes oblique, narrow and pointed at the inner margin, of very unusual shape. S. Calif. .... *straba* Horn
- EE. Pubescence cinereous. Eyes oblique but not con-



- spicuously modified. S. Calif. . . . *afoveata* Werner
- CC. Head with a pit-like depression at the inner posterior margin of each eye.
- D. Depressions shallow, more or less indistinct. Occiput with a broad, median impression which leaves a conspicuous bump behind the inner margin of each eye.
- E. Pubescence on pronotum similar to that on elytra, sparse. Disc of pronotum bulging. Occipital impression not deep. Pubescence cinereous. S. Calif. *impressifrons* Van Dyke
- EE. Pubescence on pronotum dense, erect, much different in length and texture from that on elytra. Occipital impression deep. Pubescence cinereous to dull luteous. Southwest Ariz. to southw. Utah *caviceps* Horn
- DD. Depressions very deep, appearing to limit the inward extent of the reniform eyes. Pubescence luteo-cinereous to dull luteous. Ariz. (Chiricahua Mts. to Baboquivari Mts. N. to Phoenix) *rileyi* Horn
- AA. Mandibles much enlarged, bent backward at an angle, meeting along their cutting edges. Pronotum conspicuously humped; head broadly triangular. Pubescence black except for some cinereous hairs on the legs and underside of head. Toluca, Mexico, Mex. . . . . *insucta* sp. n.

The Caviceps-Group is restricted to the North American continent and, within this area, to the region from Colorado to southern California and south onto the northern part of the Plateau Central of Mexico and halfway down Baja California. Two species are found outside this region, *excavatifrons* in northern Florida and along the coast of Alabama and Mississippi, *insucta* at Toluca, near the southern extension of the Plateau Central. In all known cases the adults are to be found on flowers in very late summer and fall. Since most collectors have other duties to attend to during this period, the group is poorly represented in collections. Most of the species appear to have rather restricted ranges, though more intensive collecting will probably result in recorded ranges more extensive than those used in this paper, and in the discovery of additional species, particularly on the northern part of the Plateau Central.

Following is a redescription of *singularis* Champ. and a description of *insucta* sp.n. Descriptions or redescriptions of the other species in the group will be found in the papers listed at the end.



*Epicauta singularis* Champ.

Figs. 4-6

*Epicauta singularis* Champion, 1892, Biol. Cent.-Am., Coleop. 4 (2): 427, pl. 19, f. 25, female. Vaurie, 1950, American Museum Novitates No. 1477: 30.

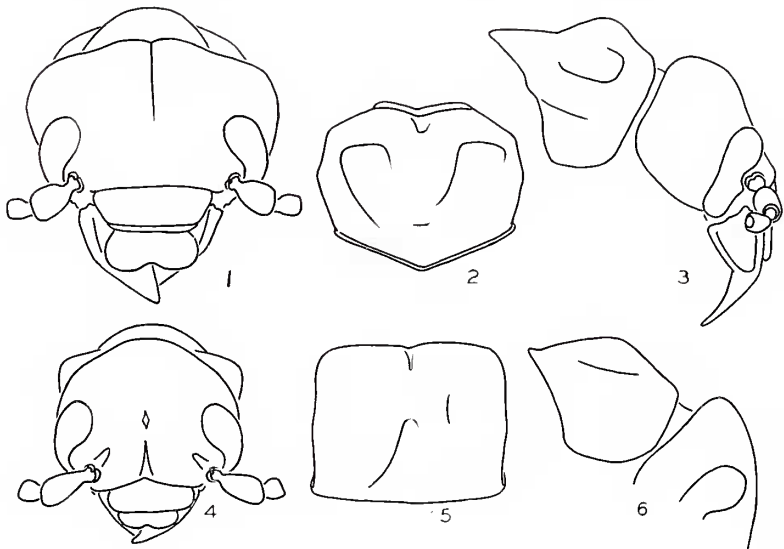
A male and a female paratype, loaned by Mr. Balfour-Browne, are the only specimens I have seen of this interesting species. The opportunity is taken here to make some additions to Champion's description.

The species very definitely belongs to the Caviceps-Group. The only species in the group with which it might be confused is *cicatrix* Werner, which differs greatly in the form of the second antennal segment.

Black, moderately densely clothed with yellow-cinereous pubescence. Head (figs. 4, 6) suboval, widest just behind the eyes, bulging at the occiput, very similar to that of *occipitalis* Werner. Surface densely punctured, strongly microreticulate; pubescence moderately long, and uniform except on the antennal calluses, which are narrow, glabrous and without punctures or microreticulation. Midline slightly impressed, narrowly denuded at the level of the eyes, partly denuded from these anteriorly to the clypeus. Eyes normal, moderately narrow, excavated, with a narrow, inconspicuous denuded margin. Mandibles normal for *Epicauta*. Antennae  $2\frac{1}{2}$  as long as an anterior tibia, black, with a little pale pubescence at the apex of segment I. Segment I reaches  $\frac{1}{3}$  across the eye; II is short,  $\frac{2}{5}$  as long as I, stout, slightly shortened behind; III and following slightly flattened, slightly broader at apex than at base, the broadening gradual; III  $\frac{1}{4}$  longer than I, IV to X subequal in length, about as long as I, tapering gradually in width; XI slightly longer than X, the narrowest segment. Proportions (in relation to a total length of 1000 units) of segments of male antenna: 124/58, 45/45, 130/52, 97/55, 97/49, 97/47, 84/42, 84/39, 81/38, 72/36, 88/33. Antennae of female similar to those of male, slightly more slender.

Pronotum (figs. 4-6) quadrate,  $\frac{1}{5}$  broader than long; disc elevated into a distinct hump at the middle, a shallow median impression extending onto the hump from behind and another, smaller, one from the front. In the male paratype this hump is truncated in front view; in the female paratype the apex appears pointed in all views. This probably represents individual difference rather than a secondary sexual character. The pubescence is normal, not thickened, and is whorled around a pair of centers before the middle of the disc.

Elytra unicolorous, without black markings at the base. The female paratype has a sutural elevation at 1/4 from apex but does not have this elevation denuded as it is indicated in Champion's figure. Underside with pubescence slightly sparser than above. In the male paratype there are midventral black spots on sternites III, IV and V. (The rest of the segments have been eaten.) The pubescence on these spots is short and sparse, practically invisible. The female paratype lacks these abdominal markings. The middle and hind femora and trochanters of the male are denuded and slightly flattened behind, with the denuded area fringed dorsally by sparse long hairs. The femora of the male are not bowed, the tibial spurs are spiniform on all legs in both sexes. Type locality: Monterrey, Nuevo Leon, designated by Vaurie, l.c. As far as I can determine this species has not been collected since it was reported by Champion. Redescribed from Monterrey paratypes.



All of the figures were made with the aid of a camera lucida. Fig. 1. *Epicauta insucta* sp.n., anterior view of head, holotype. Fig. 2. Same, dorsal view of pronotum. Fig. 3. Same, lateral view of head and pronotum. Fig. 4. *Epicauta singularis* Champ., male paratype, anterior view of head. Fig. 5. Same, dorsal view of pronotum. Fig. 6. Same, lateral view of pronotum and dorsal part of head.

***Epicauta insueta* sp.n.**

Figs. 1-3

Within the Caviceps-Group this species could hardly be confused with any other. The only other black species known, *straba* Horn, has narrow and very oblique eyes, and has normal mandibles. From other black species of *Epicauta* in North America it can be distinguished readily by the form of the mandibles, which are long and bent back at a 30 degree angle (fig. 3), somewhat like the mandibles of *E. mimetica* (Horn).

Entirely black, opaque, the pubescence black except on the mandibles, underside of head and on part of the legs, where it is cinereous. Head triangular; pronotum noticeably broader than long, with lateral impressions and a conspicuous anterior hump. Length of holotype: 9½mm. Width: Head 2.7, pronotum 2.1, and elytra at humeri 3.0 mm.

Head triangular, broad, ¼ broader than long to apex of clypeus, widest at temporal angles. The occiput bulges slightly (fig. 1) and there is a pair of small impressions near the midline between the eyes. Surface moderately densely and deeply punctured, appearing almost glabrous at low magnification because the pubescence is short, sparse and decumbent. It is longer and more prominent along the margins. The intervals between the punctures are opaque because of the deep microreticulation. Midline impressed down to the level of the eyes. The middle of the front has a narrow rufous spot in all four specimens. Antennal calluses small, not elevated, with a small impunctate area. Eyes narrow, not prominent, excavated. Clypeus separated from front by a strong transverse suture. Labrum slightly excised at middle. Clypeus and labrum with longer pubescence than rest of head. Mandibles large (figs. 1, 3), bent back at a 30 degree angle at the level of the apex of the labrum, meeting along the almost straight cutting edges. Maxillary palpi slightly enlarged in male; labial palpi with both segments elongate and tubular in both sexes.

Antennae reaching basal fourth of elytra, moderately slender, tapering gradually. Segment I short, stout, reaching 2/3 across the narrow eye; it is sharply constricted at the base, almost quadrate, tubular, slightly flattened behind. Segment II short, 7/10 as long as I; III 1.7 as long as I, slender, gradually thicker apically; IV 2/3 as long as III; V to X slightly shorter than IV, decreasing gradually in thickness; XI as long as IV. The segments beyond III are slightly flattened, slightly swollen beyond the middle. Proportions of segments in holotype (to total length of 1000 units): 93/61, 56/42, 144/44, 98/47, 88/51, 88/47, 84/47.

84/47, 82/42, 82/40, 102/40.

Pronotum (figs. 1-3) of rather unusual form, broad, roughly hexagonal. A median hump before the middle is limited behind by a weak transverse crease; from the anterior part of the hump there extend two lateral ridges and these in turn unite with ridges along the lateral margins. A pair of lateral sharp-sided depressions with flat bottoms result. Surface deeply microreticulate, densely and rather deeply punctured, the punctures denser on the hump. Pubescence short, fine, suberect on the hump, decumbent over rest of surface. Median impressed line distinct, widest anteriorly. Basal and apical impressed lines distinct.

Elytra subparallel, with the suture elevated slightly at the basal third. In the female allotype this elevation continues to the apical fourth. Surface smoother than that of head or pronotum but still quite opaque, moderately densely and finely punctured. Pubescence longer than on head and pronotum, moderately sparse and decumbent, not conspicuous. Underside with some cinereous pubescence, on the underside of the head, on the anterior side of the pro-coxae, femora and tibiae, a few hairs on the posterior side of the meso- and meta-coxae, trochanters and femora. In the male the meso- and meta-femora have the posterior surface slightly flattened but not glabrous, and margined above with sparse, long, cinereous pubescence. The meso- and meta-trochanters also have similar pubescence. The female allotype lacks these long hairs and has normal legs. The tibial spurs are slender and spiniform, except on the meta-tibiae, where they are slender and more sticklike. Underside of abdomen of male with no sign of denuded spots.

The female allotype has the punctures on the head finer than do the males. It, the holotype and one male paratype have an indication of a small smooth area in the middle of the discal depressions of the pronotum. The other male paratype lacks these.

Holotype: male, Toluca, Mexico, MEXICO, Aug. (19)03. W. L. Tower Collection (AMNH).

Allotype: female, eutopotypical (AMNH).

Paratypes: 2 males, eutopotypical (AMNH & Werner).

#### REFERENCES

- Werner, F. G., 1945, Bull. Museum of Comparative Zoology 95: 423, 425-435, 481-489. (see for redescriptions and references to original papers)
- , 1949, Psyche 56: 103-108, fig. 2 A, B. (*ajovcata* Werner, *impressifrons* Van Dyke, *occipitalis* Werner)
- , 1951, Psyche 57: 131-133, fig. 5. (*cicatrix* Werner)